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AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

SCIENTIST AND ENGINEER CAREER PATTERNS FOR AIR FORCE CIVILIANS AND OFFICERS

by

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A Research Report Submitted to the Faculty

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Abstract

Technology will play a critical role in shaping tomorrow's military environment and preparing now to meet the uncertain challenges facing the nation's air and space forces. To achieve this end, the Air Force *must* employ "the best" and "the brightest" technically competent science and engineering workforce. These experts, military and civilian, are indispensable both for conducting relevant and mission essential in-house research and development as well as managing these and contracted technical activities.

To acquire, motivate, and retain these experts, the Air Force must recognize both the differences and uniqueness of their individual needs and essential to adequately compensate them, whether direct or indirect. Dual-track career paths further enhance technological competency by addressing these concerns. In addition, sharing leadership between military officers/civilians is an essential consideration. To affect this, officers and civilians must be equally qualified, technically and managerially. Finally, through reengineered and proactive career management, the Air Force can place "the right" person, military or civilian, in "the right" job at "the right" time in the person's career, and thus achieving what is "best" both for the individual and for the Air Force.

Chapter 1

Introduction

> *The men in charge of the future Air Forces should always remember that problems never have final or universal solutions, and only a constant inquisitive attitude toward science and a ceaseless and swift adaptation to new developments can maintain the security of this nation through world air supremacy.*
>
> Theodore von Karman

"I believe the security of the United States of America will continue to rest in part in developments instituted by our educational and professional scientists."[1] This conviction from the Commanding General of the Army Air Forces (AAF), General of the Army Henry Harley "Hap" Arnold, was integral in his decision to activate the AAF Scientific Advisory Group in 1944. Under the direction of Dr. Theodore von Karman, this group was chartered to recommend sound AAF research and development programs "guaranteeing the security of our nation and serving as a guide for the next 10–20 year period."[2]

Their findings, *Toward New Horizons*, founded a long-range aerospace research and development program for the nation. The technologies derived therefrom have been integral in the nation's ability to achieve air and space superiority, global attack, information superiority, precision engagement, and, to a lesser degree, rapid global mobility and agile combat support. Such are core competencies of a preeminent

aerospace warfighter—an Air Force with absolute and dominant technical superiority applicable across the full spectrum of crises in an uncertain future.

To achieve this degree of technical report, the AAF Scientific Advisory Group knew that the Army, now, the Air Force, *must* employ "the best" and "the brightest" technically competent science and engineering workforce. As such, their analysis developed the organizational framework for what would become the Air Force's military and civilian scientist and engineer community. These experts, military and civilian, are indispensable both for conducting relevant and mission essential in-house research and development as well as managing these and contracted technical activities.

To motivate and retain these experts, the Air Force must first recognize the differences and uniqueness of their individual needs and second provide adequate compensation, whether direct or indirect. Dual-track career paths for technical and administrative positions might further enhance technological competency by addressing both these issues. Analysis for providing shared military/civilian leadership is also important. Finally, through reengineered and proactive career management, the Air Force can place "the right" person, military or civilian, in "the right" job at "the right" time in the person's career, and thus achieving what is "best" both for the individual and for the Air Force.

Notes

[1] Dr. Theodore von Karman, *Toward New Horizons: Science, the Key to Air Supremacy*, (Washington, D.C.: Army Air Forces Scientific Advisory Group, 1945), iii.

[2] Ibid.

Chapter 2

Air Force S&E Officer Career Development

> *There is no magic formula to ensure you achieve a successful career in today's Air Force—you may have many different types of assignments during your entire career, but it's these different assignments that contribute to the many facets of your professional development…*
>
> Officer's Handbook on the Officer Assignment System

With the founding of the Department of the Air Force, American leaders recognized the nation's dependence on new technologies and innovation, especially in the successful achievement of the Air Force unique roles and missions. This realization today is reinforced by the *Joint Vision 2010* statement that technological innovation is a unifying concept for achieving Full Spectrum Dominance. The debate is how the Air Force should be organized and staffed so as to maximize its exploitation of new technologies whether via revolutions in military affairs or military technological revolutions.

Numerous studies have been conducted since 1947 attempting to define the role, if any, Air Force officers should play in defining and/or generating technological innovation during each phase of science and engineering (S&E) research and development (R&D): basic research, exploratory development, advanced development, and system development. In a staff study to the Air War College, Lt. Col Hemm analyzes five options for the way the Air Force could employ officers in R&D.[1] First, the Air Force could exclude officers from R&D activities altogether. Second, officers could

be restricted to R&D command positions. Third, the Air Force could utilize officers as both R&D commanders as well as R&D managers. Fourth, officers, along with civilian counterparts, could be employed at all levels of R&D. Finally, the Air Force could use only military officers in R&D.

Despite the wide disparity in types of analyses performed and perspective end-states, these studies state that the Air Force must employ career military officers to participate in, and to manage, R&D activities. "There is clear recognition of the fact that the primary need for highly qualified military scientists and engineers is to provide military judgment in the management of the extensive military research and development program and to relate the results of that program, as well as all other technological advances, to new weapon systems."[2] They proceed to expound on why "the career Air Force officer in scientific research [or engineering] must be a scientist [or engineer]"[3] and that "'there cannot be outstanding technical leadership until such times as our leaders become men who in their youth did outstanding technical work themselves.'"[4]

As of 30 September 1997, of 73,983 Air Force officers, 1,091 were employed as scientists and 3,022 as engineers with an Air Force Specialty Code (AFSC) of 61S or 62E, respectively.[5] Table 1 provides a breakdown by grade and MAJCOM assignments for AF science and engineering officers as of November 1998. Although other Air Force units and career fields can benefit from officers with science and engineering background, for the purpose of this project, scientists and engineers are restricted to those officers assigned to primary fundamental R&D functions, intelligence, and/or education, including joint assignments.[6] Of the 855 61S and 2425 62E positions listed in Table 1,

only 613 61S and 1819 62E positions are deemed scientific or engineering per this definition.

Table 1. Grade versus MAJCOM Distribution of AF S&E Officers

AFSC	*MAJCMD*	*2LT*	*1LT*	*CAPT*	*MAJ*	*LTC*	*COL*	*Total*
61S / 62E	BMD/DSW			9 / 4	7 / 19	7 / 2	1 / 3	24 / 28
	JT COM		0 / 1	6 / 2	6 / 9	2 / 2	1 / 0	15 / 14
	AFSPACE	0 / 16	2 / 28	7 / 58	8 / 20	1 / 6	1 / 2	19 / 130
	AIA/DIA	8 / 52	11 / 51	24 / 105	7 / 51	2 / 20	0 / 7	52 / 286
	AMC		0 / 1	5 / 3	2 / 4	1 / 0		8 / 8
	ACC	10 / 25	13 / 33	31 / 71	5 / 20	2 / 1		61 / 150
	AETC	20 / 5	27 / 1	18 / 9	13 / 14	8 / 3	0 / 1	86 / 33
	USAFA	0 / 1	1 / 0	52 / 39	30 / 26	26 / 14	9 / 6	118 / 86
	AFSOC		1 / 0	3 / 4		0 / 1		4 / 5
	AFMC	38 / 173	47 / 261	87 / 589	46 / 189	16 / 76	3 / 17	237 / 1305
	AFOTEC	6 / 0	4 / 4	27 / 24	14 / 21	4 / 9	1 / 0	56 / 58
	SAA/MSA		1 / 0	8 / 0	10 / 3	2 / 1		21 / 4
	AFTAC	6 / 2	3 / 2	27 / 10	7 / 5	6 / 3	0 / 1	49 / 23
	DLA/LMA	1 / 0	2 / 7	4 / 12	4 / 4	2 / 3		13 / 26
	OTHER	5 / 3	10 / 7	25 / 101	33 / 105	17 / 46	2 / 7	92 / 269

Source: Personnel Statistics, Nov 1998, available from http://www.afpc.randolph.af.mil.

Staffing and Assignments

The Air Force has utilized various assignment processes in attempts to place "the right person" on "the right position" at "the right time" in each officer's career. Early processes involved non-voluntary transfer of officers from one position to another based on what was in the best interest of the Air Force. These moves were accomplished via the one-to-one communications between commanders. Being concerned primarily with the "needs of the service," these senior officers frequently moved officers into

assignments where their technical expertise could be neither utilized nor developed. Officers were dependent on their senior official's willingness to mentor them as well as the senior officer's sponsorship and professional network. This too often culminated in a "battle of rank" between competing senior officers rather than an assessment of whom would be the best incumbent for the Air Force.

To address these and other assignment issues, centralized career management programs were established for various functional communities. PALACE Vector was adopted in the mid-1970s as part of this effort.[7] PALACE Vector provide the Air Force with the opportunity to categorize R&D positions throughout the Air Force, revise the use of Specialty Codes, and develop and implement Special Experience Identifiers for R&D. This was one of the last functional communities to participate in centralized position management. Centralized management of functional career development was critical in the transition from the non-voluntary to the voluntary officer assignment system.

> Prior to 1991 the officer assignment system was primarily driven by requirements where officers generally went *where* and *when* they were told. In 1991, the implementation of the Officer Volunteer Assignment System (OVAS) brought about a more open system, where most officers only went to places they volunteered for, and at the timing of their choice. In 1995, OAS was implemented to strike the right balance between members' personal Officer Professional Development (OPD) desires, and commanders' needs/mission requirements. The result is a philosophy of "Service above Self." This philosophy encourages volunteerism but still focuses on the needs of the Air Force (go where needed when it's your turn).[8]

The voluntary officer assignment system was also found lacking, particularly in its ability to fill "less desirable" positions, and the Air Force is currently developing and implementing a new non-voluntary officer assignment system. The premise of this new process, as with the former non-voluntary assignment system, is that the needs of the service will be best achieved through a management initiated and selected assignment

system. Assignments will be made via one-to-one communications between commanders attempting to employ "the right officer" in "the right position" at the "right time."

The "right time" for whom? Officers currently working their follow-on assignments from Air Command and Staff College have already witnessed multiple assignments being made based on the number of stars worn by the incumbent's sponsor. The questions of whom is the "right person" for the job and whether or not this is the "right time" in *that* person's career are, at best, rarely asked. Centralized career program offices were established to identify the "who, where, when, and *why*" of officer assignments and to serve as the "honest broker." Unless these responsibilities are proactively built into the new process, the new officer assignment system will be little more than the predecessor system under a new title. That system failed when the balance between sponsorship of good old boys and the interests of the Air Force as a whole was lost.

Career Path Pyramids

> Today, as an Air Force officer you have more responsibility for your career than officers had in the past. Your destiny is largely in your own hands and you have to make important decisions about your career early on. We recognize you may need help and guidance to navigate the path best for you, and best for the Air Force. There is no magic formula to ensure you achieve a successful career in today's Air Force—you may have many different types of assignments during your entire career, but it's these different assignments that contribute to the many facets of your professional development (OPD)—formal training, promotion, leadership opportunities, staff experience, advanced and professional military education, etc. All these combined are what define "career success."[9]

The Air Force has established career progression patterns, career path pyramids, to assist officers in planning their careers. A sample career path pyramid for scientific R&D is shown in Figure 1. These career patterns suggest "the right time" in an officer's career for when professional military education (PME) and formal academic education become

important as well as what level (e.g., lab, MAJCOM, HQ) assignment ought to be considered. The pyramid recommends those points in an officer's career when the officer should be developing technical depth and expertise versus building breath of experience.

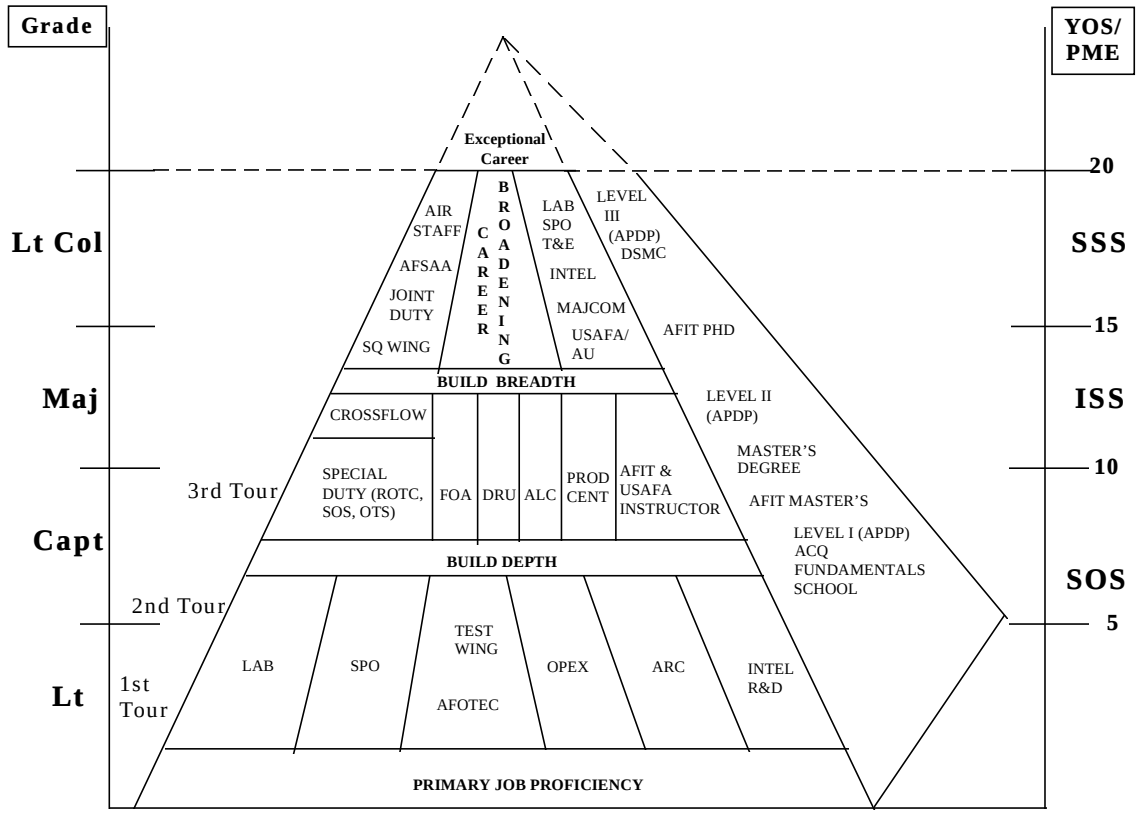

Figure 1. Scientific R & D Career Path Pyramid (Military)[10]

Career development is essential in shaping tomorrow's military air and space force. It focuses on the "complete" professional development of the person – technical expertise, breadth of experience, leadership qualities, and management skills. By developing the whole person and "the capabilities of its people, the Air Force is ensuring that there will always be highly qualified people to lead at the highest echelons."[11]

Despite the existence of career path pyramids and considerable quantities of generalized guidance for each the scientific R&D and developmental engineers functional communities, "it does not specify the types of assignments the officer-scientist [or

engineer] should seek in order to maximize his [or her] value to the Air Force."[12] Major Brabson, in a study for the Armed Forces Staff College, proposes more specific progression paths for rated versus non-rated and degreed versus non-degreed scientists. In his study, Lt Col Hemm continued to evaluate four options for the career development of Air Force S&E officers: (1) Restrict assignment of military scientists to R&D positions, (2) Systematically rotate military scientists and engineers to operational assignments for normal three- to four-year tours between R&D assignments, (3) Restrict assignments of military scientists and engineers to R&D positions, but systematically assign them for three- to nine-months with operational organizations, or (4) Assign military scientists and engineers to operational positions for the first part of their careers and transfer them into R&D positions during the later portion thereof.[13]

When assessing the elements of professional development or a career progression pattern, the needs of both the Air Force as well as the individual should be considered. Simon Marcson identifies four types of careers for R&D professions.[14] The first are those S&Es who chose to remain actively involved in "hands-on" R&D regardless of external influences. The second are those who forgo the "hands-on" S&E for the interests of the organization in light of "organizational success." The third are those S&Es who, despite being motivated by professional aspirations, pursue organizational and administrative positions due to financial rewards. The forth are those individuals, primarily interested in R&D, who transfer to administrative positions as these positions more closely align with their professional capabilities.

Within the military system, however, career progression channels and assignment protocols, current as well as that being developed, imply that all officers are *expected* to

fall in category two. Assignments and published career patterns drive officers to transfer from technical positions to management jobs in order to compete for the extremely limited number of senior officer positions. Therefore, despite the Air Force sponsoring advanced technical academic degrees for many officers in S&E, these individuals are removed from the technical activities just at the moment they are prepared to achieve technical success.

Furthermore, various military S&Es have personalities and professional motivations that clearly identify them as belonging to categories other than Marcson's second type of R&D professional. Forcing their assimilation into a different category may equate to placing a "square peg in a round hole."

The Air Force's future ability to recruit and retain high caliber S&E professionals depends on their ability to provide ample career growth opportunities as well as meaningful and useful professional training and development. The Air Force career path pyramids provide formal professional development and career progression guidance against which individual officers *plan* and *program* their career. The quality of this technical and leadership development along with the effectiveness of assignments and career progression ensure (or define) the future for Air Force technology and materiel supremacy. Adams claims that career path pyramids are, in themselves, insufficient. His report discusses how effective and deliberate coaching, leadership, and management are all key elements for successful professional S&E development.[15]

Acquisition Professional Development Program

The Defense Acquisition Workforce Improvement Act (DAWIA, 1990) imposes special legislative requirements on federal employees working in acquisition positions "in

which the primary responsibilities are supervisory or management duties."[16] Science and engineering is a fundamental component of the Air Force's Research, Development, Test, and Engineering program actively involved in *all* phases of the acquisition lifecycle of aerospace materiel. S&E officers, therefore, are legislatively included in the acquisition corps. There are four acquisition functional areas in which acquisition officers from the S&E community can fulfill these requirements: (1) System Planning Research, Development, and Engineering, (2) Quality and Manufacturing Production, (3) Test and Evaluation, or (4) Program Management. Whereas fulfillment of the Acquisition Professional Development Program (APDP) requirements are legislatively mandated for assignment to "positions of opportunity," officers frequently use these requirements, in place of the career path pyramids, for developing their career paths.

Table 2. Critical Acquisition Positions (Military)

POSITION CATEGORY	MAJ	LT COL	COL	GEN	TOTAL
MANUFACT/PRODUCTION	1	3	2	0	6
PROGRAM EXEC OFCR	0	0	1	3	4
PROGRAM MANAGER	44	490	234	26	794
SYS PLAN RES and DEV	16	140	42	2	200
T&E ENGINEERING	4	89	23	3	119
TOTAL	99	1043	418	38	1598

Source: Personnel Statistics, Nov 1998, available from http://www.safaq.hq.af.mil/.

As Adams states, however, a successful career is one achieving the appropriate balance; this is facilitated via proper counseling, leadership, and management.[17]

Despite all of the handbooks, manuals, instructions, and guidance, new career paths with refined professional development and career broadening opportunities are needed. Efforts are currently underway to revise officer promotion and assignment systems.[18] The Air Force must "provide the framework to build and maintain a civilian and military

professional force of Air Force scientists and engineers that supports the Air Force mission…an agile workforce that quickly responds to the technology challenges of the 21st century."[19]

Notes

[1] Lt Col Robert V. Hemm, *How Should the Air Force Use and Develop "Blue Suit" Scientists and Engineers in Research and Development,* (Maxwell AFB, Ala.: Air War College, 1966), 21.

[2] Ibid., 15.

[3] Lt Col William G. Ashley, *The Air Force Officer in Scientific Research,* (Maxwell AFB, Ala.: Air War College, 1964), 57.

[4] Quoted in Col Frederic Glantzberg, *Air Force Personnel Policy for Professional Engineering and Scientific Officer Specialists,* (Maxwell AFB, Ala.: Air War College, 1948), D-2.

[5] Tamar A. Mehuron, ed. "Air Force in Facts and Figures," *Air Force Magazine* 81, no. 5 (May 1998): 36 – 38.

[6] Air Force Manual (AFMAN) 36-2105, *Officer Classification,* October 1995.

[7] Lt Col Thomas E. Shelton, *Management of the Air Force Research and Development Officer Resource: 1975 and Beyond,* (Maxwell AFB, Ala.: Air War College, 1975), n.p.

[8] *Officer's Handbook on the Officer Assignment System,* (Randolph AFB, Texas: Air Force Personnel Center, 1997), 4.

[9] Ibid., 2.

[10] *Officer Career Path Guide,* (Randolph AFB, Texas: Air Force Personnel Center, 1997), 76.

[11] Maj Cynthia L. Benulis, *Moving Right Along…A Guide to Career Development for Air Force Transporation Officers,* (Maxwell AFB, Ala.: Air Command and Staff College, 1983), 8.

[12] Maj George D. Brabson, *Career Progression for Chemists in the Air Force,* (Norfolk, Virginia: Armed Forces Staff College, 1970), 2.

[13] Hemm, 33.

[14] Simon Marcson, *The Scientist in American Industry,* (New York City, NY: Harpers and Brothers, 1960), 74.

[15] Maj William E. Adams, *The Development of the Scientific and Engineering Officer as a Manager,* (Maxwell AFB, Ala.: Air Command and Staff College, 1973), 59.

[16] Air Force Pamphlet (AFPAM) 36-2630, *Officer Professional Development Guide,* May 1995.

[17] Adams, 59.

[18] Rick Maze, "New Career Route for Officers?", *Air Force Times* 55, no. 10 (October 1994): 8.

Andrew Compart, "Officer Career-Management Rules Reviewed", *Air Force Times* 57, no. 45 (June 1997): 3.

Notes

[19] *Strategic Plan: Air Force Scientist and Engineer Career Program*, (Randolph AFB, Texas: Air Force Personnel Center, 1999).

Chapter 3

Air Force Civilian S&E Career Progression

> *As we move into the 21st century, Government executives face special challenges. They must be visionary leaders with a strong commitment to public service…. Finally, they need solid management skills in order to produce optimum results with limited resources.*
>
> Guide to Senior Executive Service Qualifications

As discussed in the last chapter, numerous academic studies have attempted to define the appropriate balance and relationship between Air Force officers and civilians for managing, defining, and/or producing tomorrow's military technological revolutions. Options have been presented ranging from absolute exclusion of civilians in Air Force R&D activities to the complete "civilianization" of these functions.[1] Defining the appropriate mix of military, civilian, and contractor personnel for today's science and engineering workforce continues to be a significant concern to the Air Force.[2]

A critical and in-depth analysis by Maj Dugan, submitted to the Air Command and Staff College faculty, compares employment of military versus civil service in Air Force R&D.[3] Maj Dugan reviews recruitment, procurement, retention, and compensation issues. The report recognizes the ability of the service to better compensate Air Force officers while more efficiently recruiting and retaining civil service scientists. Despite the wide disparity of initial perspectives, these studies reach the same basic conclusion. The Air Force must employ "highly qualified military scientists and engineers to provide

military judgment in the management of the extensive military research and development program"[4] and highly qualified civilians "to stabilize and improve the quality of management."[5] While civilians and officers may have differing professional motivation and disparate perspectives on their jobs, neither can provide "'outstanding technical leadership until such times as our leaders become men who in their youth did outstanding technical work themselves.'"[6]

Bottom-line: "The Air Force scientist and engineer community, military and civilian, is one team with one mission."[7]

As of 30 September 1997, of 99,670 General Schedule civilian Air Force employees, 9,768 were employed as scientists or engineers above pay-grade GS-11.[8] Table 3 provides a breakdown of GS-12 through GS-15 grade S&E civilians by MAJCOM as of December 1998. As with the consideration of Air Force officers, for the purpose of this project, scientists and engineers are restricted to civilians assigned to primary fundamental R&D functions, intelligence, and/or education, including joint assignments as eligible for participation in the Scientist and Engineer Career Program.[9] For practical purpose, this includes the 9,032 positions in AFMC, AIA, AFSPC, and AFOTEC.

Table 3. Grade versus MAJCOM Distribution of AF S&E Civilians

Command	GS-12	GS-13	GS-14	GS-15	Total
ACC	90	48	23	3	164
AFMC	3,588	3,244	907	458	8,197
AFSPC	58	119	36	7	220
AIA	182	226	109	29	546
AFOTEC	9	45	12	3	69
Other	156	193	88	42	479
Total AF S&E Civilians	4,083	3,875	1,175	542	9,675

Source: Scientist and Engineer Career Program, Air Force Personnel Center, Dec 1998.

Staffing and Assignments

> The Civil Service Reform Act (CSRA) (Public Law 95-454) requires executive management in the Federal Government to be the highest quality and respond to the needs, policies, and goals of the Nation. Specifically, it requires agencies to provide for the development of highly competent senior executives…. Civilian career programs will develop employees with strong professional, technical, managerial, and administrative skills to satisfy current and future Air Force mission needs.[10]

To achieve these lofty ambitions, the Air Force civilian career programs identify "highly qualified and high potential individuals."[11] Supervisors and functional managers are tasked to provide these employees with ample opportunity to improve their professional skills, to participate in planned professional development programs, and to progress through the organization. When a supervisory, management, or key position becomes vacant, the appropriate career program provides the selecting official with a list of the "best qualified," yet interested, candidates from across the service. The selection process for candidates receiving centralized training and/or development opportunities includes the "racking and stacking" of applicants. Civilian career programs and servicing civilian personnel flights are responsible to ensure that the selection processes for training, development, and promotion are fair and equitable.

At the same time, technical managers continue to serve as selection officials. This technical oversight is imperative in identifying "the right person" for "the right position" at "the right time" in the person's career. Given the limited size of the S&E functional community, most senior officials, civilian or military, know each other. One-to-one communications between these officials can often provide insights into this process that computerized personnel records cannot, similar to the new officer assignment system.

Career programs, such as the Scientist and Engineer Career Program, are evaluating this concept as part of its candidate identification process.[12]

Management realizes that many civilian S&Es prefer to remain technically oriented rather than transitioning to management, whether for the money, advancement, or prestige. As their professional reputations improve, the technical opportunities, professional freedoms, and/or financial compensation offered by private companies and academic institutions become more enticing. The Air Force has established a quasi-dual track career progression within the R&D functional community to combat this retention dilemma. Under this system, civilian scientific and engineering technical experts have the opportunity to compete for a limited number of higher grade General Schedule, i.e., GS-14 and GS-15, as well as Scientific and Professional (ST) positions. These positions are technically specific and require a very precise scientific/engineering background. As such, qualified referrals tend to be found only within the same unit as the vacancy.

In 1995, the Scientific Advisory Board recognized that the Department of Defense Science and Technology centers were still unable to retain top quality researchers. The Air Force Laboratory Personnel Demonstration Project[13] was approved in November 1996 to waive certain 5 CFR (Code of Federal Regulations) restrictions and limitations on professional recognition and compensation. Under this new system, civilian S&Es within the Air Force Research Laboratory are compensated for their technical and professional contributions rather than for seniority or external standards. This system implemented an actual dual track professional development program within the S&E functional community, and given only precursory results, has proven an effective agent for constructive change.

The Civilian Personnel Management System of the Office of the Secretary of Defense is currently investigating the potential of resume scanning in the identification/ranking of applicants; both from within the service and from outside. Experimentation of this system is underway at two Air Force installations as well as a limited number of Army Posts and Naval Bases. The greatest concern with this new system is the same as for the new officer assignment system—it replaces management's primary responsibility with an "expert" system incapable of predicting skills, securing performance, or replacing human analysis. Such protocols also fail to ensure the balance between mentoring and sponsoring. Without being as directly involved as they might have been in the past, personnel flights will be charged with a greater responsibility of ensuring the integrity of these systems.

Career Path Pyramids

The career path pyramid for civilian S&Es under the Scientist and Engineer Career Program is shown in Figure 3. As for officers, career path pyramids represent "the right time" in a professional's career for when specialized training and development, formal academic education, or career broadening become important.

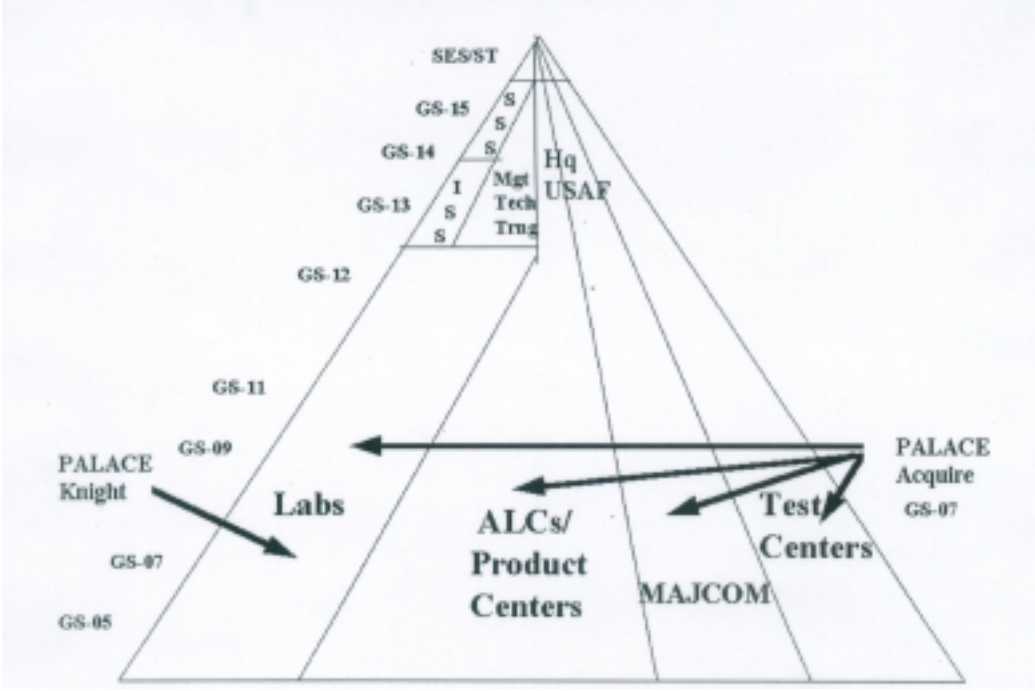

Figure 2. Scientific R & D Career Path Pyramid (Civilian)[14]

Civilian S&Es normally achieve the journeyman level at the GS-11, GS-12, or GS-13 grade, depending on the organization in which they are employed. At Product Centers, Test Centers, and Logistic Centers, journeyman S&Es usually have a bachelor's degree with several years of "apprentice-like" experience within the organization. Within the Air Force Research Laboratory, the journeyman S&E is more likely to be conducting independent basic science or applied engineering. These positions require individuals with advanced academic degrees and, therefore, tend to be graded at the higher levels.

Taking these issues into consideration, the career program is currently developing a new set of career path pyramids for this functional community.[15] Although consistent to a basic template, each sub-functional area will have its own pyramid. Such policy begins to address some of the issues presented here, yet it *may* tend to "stove pipe" personnel thus constricting their breadth of exposure requisite to gaining appreciation for programmatic relevance and interoperability.

The Scientist and Engineer Career Program Policy Council recognizes that many professionals remain within their same organization (or class of organization) as they progress from the journeyman to senior levels.[16] Mobility within this field is almost non-existent. The Executive Resource Board (ERB), Development Panel recognizes similar trends across several Air Force career fields. The ERB is concerned about this issue and wishes to stress the importance of career breadth as part of the identification process of the "best" candidates for career program vacancies.[17] Career breadth will be incorporated as a critical element of a mandatory Whole Person Score program used in racking and stacking otherwise equally qualified referral candidates. The impact of this change has yet to be assessed.

Demonstrated career breadth will also be used as an element in the identification and selection of professional development and training opportunities. Participation by senior level civilians in these programs will require them to sign mandatory mobility agreements. A Commander's statement documenting how the employee's participation in this training activity will prepare the individual to accept new and greater responsibilities across a broader range of duties will have greater impact on the selection board than those lacking such assurances. Career programs across the Air Force are currently revising their career path pyramids to reflect this new philosophy.

As with military S&E officers, civilian S&Es have both personal and professional motivations that clearly identify them as belonging to each of Marcson's four categories of R&D professional.[18] Forcing their assimilation into a category different from their personal preference may equate to driving a "square peg in a round hole." Such an environment may prove fertile ground for motivation/compensation theory.

Revised Scientist and Engineering Career Program career path pyramids must account for dual track progression, career breadth, and technical expertise. Coaching, counseling, and mentoring are also needed.

Acquisition Professional Development Program

The Defense Acquisition Workforce Improvement Act (DAWIA, 1990) imposes the same legislative requirements on civil servants, at or above GS-13 equivalence, working in acquisition coded positions "in which the primary responsibilities are supervisory or management duties"[19] as it does on field grade and higher military acquisition officers. Although fulfillment of Acquisition Professional Development Program (APDP) requirements are legislatively mandated for assignment to "positions of significant responsibility," many deprive themselves of career advancement opportunities. Table 4 shows the number of controlled acquisition positions associated with science and engineering.

Table 4. Critical Acquisition Positions (Civilian)

POSITION	GS-13	GS-14	GS-15	SES	TOTAL
QUAL & MAN PRODUCTION	0	14	2	1	17
PROGRAM MANAGER	3	120	89	17	229
SYS PLAN RES and DEV	29	409	225	44	707
T&E ENGINEERING	1	111	30	6	148
TOTAL	54	1013	487	86	1640

Source: Personnel Statistics, Nov 1998, available from http://www.safaq.hq.af.mil/.

As objectives of the new *Strategic Plan: Air Force Scientist and Engineer Career Program,* civilian S&E career path pyramids currently under development will incorporate APDP requirements, a greater emphasis on career broadening opportunities, as well as an accentuation of appropriate academic and professional military education at each grade level.[20] Distinct pyramids should be developed to account for differences in,

while providing for career growth opportunities for, both the technical and administrative professional paths. In addition, some recognition of the disparate scientific and engineering requirements for Product Centers, Test Centers, Logistic Centers, MAJCOMs, and Laboratories should be taken into account. The drafted policy of separate pyramids for each sub-functional community, however, is too extreme, and it *may* build an impassable crevasse between them. The goals, as with military officers, are to recruit, train, and retain high caliber, dedicated, and career-minded professionals for their entire careers. The Air Force must "provide the framework to build and maintain a civilian and military professional force of Air Force scientists and engineers that supports the Air Force mission…an agile workforce that quickly responds to the technology challenges of the 21st century."[21]

Notes

[1] Lt Col Robert V. Hemm, *How Should the Air Force Use and Develop "Blue Suit" Scientists and Engineers in Research and Development,* (Maxwell AFB, Ala.: Air War College, 1966), 21.

Lt Col William G. Ashley, *The Air Force Officer in Scientific Research,* (Maxwell AFB, Ala.: Air War College, 1964), 47.

[2] Brig Gen Robert P. Bongiovi, "AFMC 6XXX Study", briefing, Air Force Materiel Command, Wright Patterson AFB, Ohio, 16 February 1999.

[3] Maj Obadiah A. Dugan, *Is Civil Service the Answer to the United States Air Force's Scientific and Engineering Shortage?*, (Maxwell AFB, Ala.: Air Command and Staff College, 1963).

[4] Hemm, 15.

[5] Ashley, 5.

[6] Quoted in Col Frederic Glantzberg, *Air Force Personnel Policy for Professional Engineering and Scientific Officer Specialists,* (Maxwell AFB, Ala.: Air War College, 1948), D-2.

[7] *Strategic Plan: Air Force Scientist and Engineer Career Program*, (Randolph AFB, Texas: Air Force Personnel Center, 1999).

[8] Tamar A. Mehuron, ed., "Air Force in Facts and Figures", *Air Force Magazine* 81, no. 5 (May 1998): 36 – 38.

[9] Air Force Manual (AFMAN) 36-606, *Air Force Civilian Career Program Management*, July 1995.

Notes

[10] Air Force Instruction (AFI) 36-601, *Air Force Civilian Career Program Management*, July 1994.

[11] Ibid., 1.

[12] Minutes of the Scientist and Engineer Career Program Policy Council, December 1998. (DRAFT)

[13] "Air Force Laboratory Personnel Demonstration Project", *Federal Register* 61, no. 230, part V (November 1996).

[14] AFMAN 36-606.

[15] Air Force Manual (AFMAN) 36-606, *Air Force Civilian Career Program Management*, 1999. (DRAFT)

[16] Minutes of the Scientist and Engineer Career Program, November 1997.

[17] Minutes of the Executive Resource Board, Development Panel, Workgroup 5; n.p.

[18] Simon Marcson, *The Scientist in American Industry*, (New York, NY: Harpers and Brothers, 1960), 74.

[19] *Acquisition Professional Development Program Guide*, (Washington, D.C.: AFPEO/CM, 1994).

[20] *Strategic Plan: Air Force Scientist and Engineer Career Program.*

[21] Ibid.

Chapter 4

Shared Military—Civilian Leadership

> *The policy is to employ civilians to provide skills not usually found in military strength, to furnish precision and continuity in functions requiring them, to build a nucleus of trained personnel for expansion in time of emergency and to free military personnel for tactical duties.*
>
> —Lt Col Robert N. Loyd

> The relative roles of the military and civilians are not adequately defined by the Air Force. This must be done if the difficult and complex military–civilian problems of management, supervision and proper utilization of each group are ever to be solved. Studies and investigations have revealed some serious management discrepancies. Overstaffing in support activities, utilization of military personnel in civilian-type positions (vice versa), and the duplication of supervision by military and civilian personnel are examples. While some progress is being made in this area, it is urgent that these aspects of manpower management continue to be reviewed with the view of establishing some governing criteria. Requirements can then be more clearly defined and positions filled by the right man, military or civilian.[1]

This comment was stated in 1956 and has been reiterated several times since. Although valid across the Air Force, this issue of determining the proper balance between civilian and military personnel has far greater impact on the scientific and engineering functional communities. The "proper" solution may not be the same for administrative posts as it is for technical positions.

Defining the appropriate mix of today's military, civilian, and contractor personnel in S&E disciplines throughout the Air Force Materiel Command is currently being reevaluated.[2] In their revised strategic plan, the Scientist and Engineer Career Program

states as one of its core values that "we believe that Air Force leadership should pay equal attention to and provide equal opportunities for civilian and military career growth. The Air Force scientist and engineer community, military and civilian, is one team with one mission."[3]

For several years, the ratio of civilian to military S&Es has tarried around 3-to-1. Current statistics provide a ratio of just under this. In a report to the Air War College, Lt Col Ashley discusses the advantages and disadvantages of retaining this status quo and of changing this balance significantly.[4] His findings refute concepts of converting scientific R&D to either an all military or an all civilian workforce. His recommendation calls for the inverting of the civilian to military ratio. The bases for this posture are that "it would recognize the growing importance of the military scientist to the Air Force… [and] the probability exists that the number of military scientists would be above the 'critical mass.'"[5] The service, however, would have to place an inordinate emphasis on technical excellence in order to avoid a serious degradation in Air Force scientific integrity. In addition, this position fails to address instabilities within the officer manning levels or an up-or-out management philosophy.

His proposition, however, highlights the on-going struggle. The principal failure of these earlier studies is the melding of administrative and technical positions. Due to the differences in responsibilities, skills, and abilities, the professional qualities being sought for and developed will be dissimilar. Senior level technical positions may require very specific technical exposure while senior management positions may benefit from prior supervisory and leadership experience. Thus, the Air Force ought not to assume the ratio of civilians to military needs be the same for both groups.

The Executive Resource Board, working directly for the Director of Personnel, is addressing the potential for greater shared leadership across the Air Force. This objective presumes that key leadership positions would be able to be filled with either a civilian or a military officer. The selecting official would look at the current configuration of his organization, the qualifications and experiences of perspective officers and civil servants, and the needs of the organization in determining which candidate is "right person" at "this point" in his or her career.

Whether in the Air Force or one of the sister services, "the distinction between 'civilian' and 'military' activities will fade."[6] New career path pyramids and training and development programs must take this phenomenon into account. Shared leadership requires both civilians and military officers to attain critical professional elements, including APDP requirements, at the same stages in their professional development. The challenge resides in the identification of these "critical elements" and in ensuring that the same elements are incorporated into both career path pyramids and the selection process.

Notes

[1] Lt Col Robert N. Loyd and Maj Robert W. Hamlin, *What Should Be the Role of Civilians at Policy Levels Below Chief of Staff in 1965?*, (Maxwell AFB, Ala.: Air Command and Staff College, 1956), 1.

[2] Brig Gen Robert P. Bongiovi, "AFMC 6XXX Study", briefing, Air Force Materiel Command, Wright Patterson AFB, Ohio, 16 February 1999.

[3] *Strategic Plan: Air Force Scientist and Engineer Career Program*, (Randolph AFB, Texas: Air Force Personnel Center, 1999).

[4] Lt Col William G. Ashley, *The Air Force Officer in Scientific Research*, (Maxwell AFB, Ala.: Air War College, 1964).

[5] Ibid., 53.

[6] Capt John Allen Williams, "New Military Professionals" *US Naval Institute Proceedings* 122, no. 5 (May 1996): 43.

Chapter 5

New Air Force S&E Officer Career Patterns

Life is the art of drawing sufficient conclusions from insufficient premises.

—Samuel Butler
Notebooks

When assessing and developing the essential elements of a career path pyramid, the needs of both the Air Force as well as the individual should be considered. It *must* be recognized that: (1) Career progression patterns are constrained to work within the guise of the military officer assignment system and (2) The responsibility for an officer's career remain ultimately with that officer. Career path pyramids are useful tools for officers in identifying where and what the Air Force considers "the right" job at any given point during the officer's career. Pyramids highlight significant steps on the road-to-success.

Meaningful career path pyramids are more essential for S&E officers as this is the only functional community in which there is no single senior manager. The lack of such position, however, also tends to degrade the integrity of career progression patterns; individual organizations define their own tracks, prioritization, and philosophy on career progression. Standardized career path pyramids tend to be, therefore, descriptive rather than prescriptive.

As discussed in previous chapters, the scientific and engineering fields require technical experts in both technical and administrative positions. It is proposed that a dual

track career opportunity be established within the military structure, much like that already existent within the civilian realm.

Military Management Professionals

Before choosing between the administrative and technical track, each S&E officer *must* be able to demonstrate technical proficiency and appreciation during the earlier part of their career. "'There cannot be outstanding technical leadership until such times as our leaders become men who in their youth did outstanding technical work themselves.'"[1] Concurrently, officers are expected to fulfill elementary professional military education (PME) and Acquisition Professional Development Program (APDP) requirements.

To achieve these objectives, the S&E Military Officer Career Path Pyramid (Administrative) will show *all* second lieutenants employed in "hands-on" technical positions within a Laboratory, Product Center, Test Center, Logistic Center, or Intelligence Office flight or squadron. With regards to formal or military education, the Air Force officers are expected to complete the Aerospace Basic Course within the first year. Whereas second lieutenants are actively involved in fundamental R&D activities, they are excluded from enrollment in Management Development or Acquisition Professional Development Courses.

In order to provide ample opportunities in which to maximize this technical experience, similar activities will be expected of first lieutenants. During this phase of their professional development, however, the lieutenant should be transferred to a separate study within the organization, so as to provide exposure to a broader spectrum of science or engineering. At the same time, so as to develop professional credibility the individual should seek a master's of science degree from an accredited university. After

completion of the formal academic degree, first lieutenants should take acquisition classes in fulfillment of DAWIA legislation.

After completion of the master's of science and pinning on captain, officers should participate in-residence at Squadron Officer School (SOS). Professional Military Education (PME) is a vital part of being a professional military leader. In order to further develop an appreciation for and understanding of technical R&D activities across the Air Force, officers should be assigned, after SOS, to a three or four year technical career broadening assignment in an organizational type other than that to which initially assigned. Officers from the Laboratory should be assigned to a Product Center, Intelligence Office, or MAJCOM. Officers from a Product Center should be assigned to the Laboratory, Test Center, Logistic Center, or Operational Command. Officers from the Test Centers should be assigned to Product Centers, Logistic Centers, Intelligence Office, or Operational Commands. From the Logistic Centers, officers should be assigned to Product Centers, Test Centers, or Operational Commands. Officers from the Intelligence Offices should be assigned to the Laboratory, Test Centers, or Operational Commands.

After this career broadening assignment, captains should be assigned either back into a technical position within the original organization or in the MAJCOM. This assignment provides the officer with a greater appreciation for the relevance of R&D activities within the organization as well as an opportunity to help reprioritize projects in light of customer requirements. During this time frame, the officer is expected to fulfill requirements for Level I–Acquisition Professional Development Program. Next, the captain should participate in a management development/leadership seminar and

assessment program. These courses provide the foundation for and fundamentals of leadership and supervision.

For captains working in field positions that have completed these activities, officers should be encouraged to begin academic pursuits towards a master's in business, public affairs, etc. This degree recognizes that government is a business. In order to be effective as a manager and leader, the officer needs to be trained to understand the theories, principles, and doctrine of business management. In addition, these officers should be considered for entry-level leadership and management positions within their flight or squadron, i.e., deputy branch chief, deputy section lead, etc. Experience is the greatest teacher.

Once the officer attains the rank of major, the individual should plan on an assignment at the MAJCOM, Air Staff, or Joint Staff. Having gained a degree of technical depth and exposure to various technical areas, such an assignment will help the officer gain a higher level appreciation for how these technical activities interrelate. From such an assignment, the officer will gain an appreciation for those military problems that technology can and cannot solve. Non-staff assignments can be to leadership and supervisory positions within a flight, squadron, or possibly group. For the reasons described above, majors should plan on attending an Intermediate Service School (e.g., Air Command and Staff College) in-residence, completing a non-technical master's degree (e.g., MBA or MPA), and fulfilling the requirements for Level II-APDP. Subsequently, majors should further refine and develop their managerial and leadership skill through enrollment in complementary seminars in management development and leadership.

At the rank of lieutenant colonel, officers seeking senior administrative positions, who have not held a staff assignment, should be assigned to an Air Staff, CINC, or Joint Staff. Officers having serviced on staff should complete the rounding out of their technical breadth by serving as a Program Element Monitor, in a supervisory and management position in an R&D group, in a deputy position in an R&D wing or MAJCOM, or in a second career broadening opportunity as a deputy in a different R&D organization's group/squadron. So as to be prepared and qualified to assume key acquisition leadership positions, lieutenant colonel should fulfill DAWIA requirements for Level III-APDP. This also would be the proper time frame for participation in management development/leadership seminars and assessments should an officer not have been so involved.

Finally, at the rank of colonel, assignments should include either deputy or command positions in an R&D wing, MAJCOM, or Staff Function. At this rank, assignments are principally managerial and supervisory. As such, colonels should be able to serve as a manager in a Laboratory, Product Center, Test Center, Logistic Center, Intelligence Office, or Staff Function having supervised, managed, and led smaller organizational elements and projects throughout their career. Mobility between these organizations adds to the officer's appreciation and understanding of how each organization provides relevance to the Air Force mission. Early in the career as a colonel, each officer should complete their formal PME by participating in-residence at a Senior Service School (e.g., Air War College).

Advancement to general officer positions is beyond the scope of this project.

It is important for individuals to appreciate that the proposed professional training and development in this career progression scheme far exceeds that currently required in DAWIA certification. For Level I certification in System Planning, Research, Development, and Engineering, an individual is required to have a bachelor's degree (or experience equivalent), one year of acquisition experience, and an acquisition course. Under this proposal, the captain would possess a bachelor's degree, a technical master's degree, at least four years of technical, acquisition-related experience, as well as entry-level management and leadership exposure. The officer would still be required to take the acquisition course. For Level II certification in this program, DAWIA requirements include a bachelor's degree (or experience equivalent), two years of acquisition experience, and a second acquisition course. It is desirable for the individual to also have an advanced technical degree along with nine hours in business, finance, and/or law.

By the time the officer would be required to have Level II-APDP certification, the proposed program would require this officer to have a bachelor's degree, a technical master's degree, *and* a non-technical, i.e., business, master's degree. The officer would exceed the acquisition experience, would have demonstrated extensive management and leadership exposure, would have participated in Management Development Seminars, and would have met acquisition course requirements. For Level III certification, this proposed program would simply increase the officer's exposure to leadership and command. DAWIA requirements for Level III, excluding a third acquisition course, would have been exceeded by the time the officer was Level II certified.

As such, this proposal far exceeds the regulatory baseline established by DAWIA.

Military Technical Professionals

Below the rank of captain, the S&E officer's career progression pattern for senior technical positions is identical to that for senior administrative assignments. Approximately two to three years prior to promotion to major, only after developing technical proficiency, should an officer be *permitted* to choose which career track better suites his or her personal ambitions. It is important to note the time period for selecting a career path will be after the completion of SOS and the career broadening assignment.

Officers opting to pursue career growth in technical R&D positions should be afforded the following opportunities. It is recognized, however, that the following is *not* currently authorized under 32 CFR (10 U.S.C.) and application of the following would first require legislative demonstration authority.

This proposal converts, hypothetically, 35% of the 449 covered 61S and 1270 62E R&D positions from the captain (O-3) to colonel (O-6) ranks to demonstration slots. The basis of this demonstration, similar to the Air Force Laboratory Personnel Demonstration Project,[2] is a contribution-based compensation system. A single broadband is established between the O-3 (8 years of service) and O-6 (22 years of service) with a linear "Standard Pay Line" (SPL) connecting these respective salaries. Advancement in compensation is achieved through evaluation against six factors, "each of which is relevant to the success of a Research and Development (R&D) laboratory."[3] These factors are: (1) Technical Problem Solving, (2) Communications/Reporting, (3) Corporate Resource Management, (4) Technology Transition/Transfer, (5) R&D Business Development, and (6) Cooperation/Supervision. Officers are non-competitively "promoted" from O-3 to O-4, O-4 to O-5, and O-5 to O-6 when, in the opinion of the commander's board, the officer has demonstrated continued, that greater than two years, contributions and attained

professional reputation commensurate with the higher rank. Boards are at the wing-level for O-3 through O-5 and at MAJCOM for O-6.

Officers opting to participate in the demonstration activity are ineligible for transfer back to the traditional system. Officers participating in the administrative track can compete for reassignment to the technical track, but grade/pay retention is not assured.

On entering the demonstration project, military S&E officers should be encouraged to enroll in a doctoral degree program at an accredited university. The doctorate is a vital element of professional recognition, and the number of doctoral level professionals is a metric used to assess the technical expertise of the Air Force. To expedite and facilitate these studies, officers should attend as full-time students, with the understanding that they are to complete *all* of the graduation requirements within three years. The Air Force will need to work closely with the universities to ensure their cooperation in this program and acceptance of the time frame allotted for degree completion. One-year waivers could be made available as an exception and on a case-by-case basis. While seeking the degree, officers will receive an assumptive contribution rating corresponding to their current compensation. This entitles them to cost-of-living adjustments but precludes management from changing base salary.

At some period after degree completion, but soon after advancement to major, officers should participate in-residence at an Intermediate Service School (e.g., Air Command and Staff College). This program helps technical experts gain a better appreciation for the role R&D plays in the warfighter mission. For this very purpose, officers on the technical track should *not* be permitted to complete this program via correspondence or seminar.

As technical officers reach higher levels of this track, they likely will be providing acquisition-related advice to management. As the significance of such participation increases, officers should consider becoming APDP certified.

Such a demonstration would be required to fully enable a dual-track S&E program.

Notes

[1] Col Frederic Glantzberg, *Air Force Personnel Policy for Professional Engineering and Scientific Officer Specialists*, (Maxwell AFB Ala.: Air War College, 1948), D-2.

[2] "Air Force Laboratory Personnel Demonstration Project", *Federal Register* 61, no. 230, part V (November 1996).

[3] Ibid., 60408.

Chapter 6

New Civilian S&E Career Patterns

> *Though the tactical elements of the Air Force will remain militarized, the support activities will become more and more civilianized…. Greater training opportunities should be provided to keep them efficient and current within their specialty. This should include attendance at pertinent Air Force schools, participation in staff conferences, and temporary duty assignments for orientation whenever appropriate.*
>
> —Lt Col Robert N. Loyd

Recognizing the changes in the roles civilians will play in key Air Force leadership positions of tomorrow, senior leadership is currently revising the civilian career path pyramids. Figure 3 provides the notional framework in which career programs are to work. The Scientist and Engineer Career Program has drafted multiple patterns for the various types of R&D organizations.[1] They also are reassessing opportunities for dual-track paths.

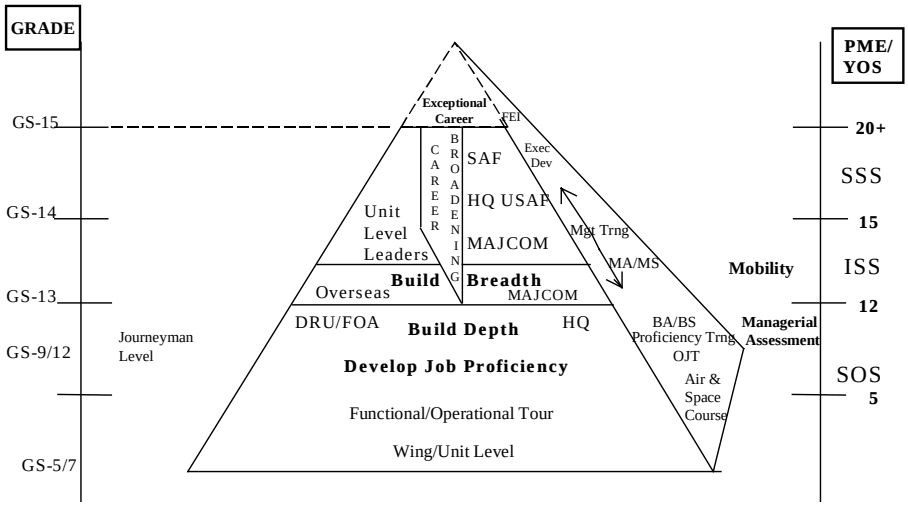

Figure 3. Civilian Leadership Framework (Notional)[2]

The basic career path pyramid for each type of R&D organization is essentially identical. The principle differences stem in defining the journeyman level. Within Logistic Centers and Test Centers, the journeyman level is typically at the GS-11/GS-12 pay grade. At Product Centers and Intelligence Offices, the journeyman level is typically at the GS-12 grade. Due to greater academic requirements within the Air Force Research Laboratory, the journeyman level in this organization is typically at the GS-13 pay grade. Other significant differences include a reassessment of whether or not each organization is an acquisition function and the extent to which these organizations perform technical activities that can be classified at higher grades.

These considerations, and others, have been incorporated into the proposed career path pyramids. Although multiple career pyramids address numerous issues presented here, it *may* tend to "stove pipe" personnel into a single organizational R&D type. This constricts the breadth of exposure that is requisite for leaders and managers to gain appreciation for programmatic relevance and interoperability.

"The Air Force scientist and engineer community, military and civilian, is one team with one mission."[3] In order to posture civilians to share key departmental leadership positions with military counterparts, the structure and core elements of civilian career progression must be similar to that of the military. At the same time, "due to the diverse nature of the career field, specific career progression must remain flexible and fit to the [specific] situation."[4]

Civilian Management Professionals

Before choosing between a technical or managerial career path, civilian S&Es, like officers, *must* demonstrate technical proficiency during the earlier part of their career. Concurrent with building this technical depth, civilians should strongly consider fulfilling elementary professional military education (PME), advanced academic degree training, and Acquisition Professional Development Program (APDP) requirements. These endeavors will prepare the civilian to better appreciate, and thus compete for, management positions.

Equivalent to their lieutenant and captain counterparts, civil servants attaining the GS-11 or GS-12 pay grade should pursue the master's of science in a technical discipline. At the GS-12 and after attaining the degree, civilians should participate, if physically capable, in-residence at Squadron Officer School (SOS). If not physically able, they should complete the program via correspondence. After SOS, each civilian should begin meeting Level I—Acquisition Professional Development Program (APDP) requirements with ambition to be certified prior to promotion to the GS-13.

On being promoted to the GS-13, civil servants should position themselves for either the technical or managerial tracks. Those opting to pursue management positions should

apply for two-year career broadening assignments in an organizational type other than that to which initially employed in order to begin building technical breadth. Prospective assignments should be similar to those defined earlier for captains. After this career broadening assignment, civil servants should return to a technical or section lead position within the original organization or type of organization. As with their military counterparts, this opportunity exposes the employee to a greater appreciation of the technical relevance of these R&D activities. Immediately, they should begin fulfilling the requirements for Level II-APDP in order to become eligible for promotion. Six to twelve months after the career broadening assignment, the employee should participate in a management development/leadership seminar and assessment to gain the foundations for leadership and supervision. In addition, they should be encouraged to begin academic studies towards a master's in business or public affairs. The rationale is, again, that government is a business, and its leaders must appreciate the fundamentals, theories, and doctrine of this field.

When being considered for GS-14, civilians should be assigned to participate in-residence at an Intermediate Service School (e.g., Air Command and Staff College) to further develop their understanding of and appreciation for the military milieu. After promotion, the requirements for Level III–APDP should be fulfilled in preparation for key leadership roles in the acquisition community. In addition, these employees should be considered for a complementary one (or two) year career broadening assignment in a deputy chief position outside the parent organization. Assignments at the GS-14 should include branch (squadron-level) chiefs, division (group-level) deputies or chiefs, and management positions at the group, wing, MAJCOM, and Air Staff. Such assignments

provide a higher level, more encompassing perspective of the roles R&D activities play across the Air Force. This also would be the proper time frame for supplemental management development/leadership seminars and assessments.

Finally, at the GS-15 rank, assignments should include either deputy or command positions in an R&D wing, MAJCOM, or Staff Function. At this rank, assignments are principally managerial and supervisory, and as such, these individuals should be able to serve as a manager in a Laboratory, Product Center, Test Center, Logistic Center, Intelligence Office, or Staff Function having supervised, managed, and led smaller organizational elements and projects throughout their career. As with officers, mobility between these organizations adds to their appreciating and understanding how each organization provides relevance to the Air Force mission. Shortly after promotion, these civil servants should complete formal PME via participation in-residence at a Senior Service School (e.g., Air War College). During this time frame, GS-15 employees should attend management seminars aimed at developing Executive Core Qualifications and Leadership Competencies.[5]

Advancement to the Senior Executive Service is beyond the scope of this project.

Civilian Technical Professionals

Civil servants should be *permitted* to pursue a technical career path after demonstrating technical depth as well as gaining an initial appreciation for the service, its mission, roles, and functions. This situation is ameliorated in the Air Force Research Laboratory via the implementation of the Air Force Laboratory Personnel Demonstration Project.[6] Under this demonstration, S&Es, whether seeking technical or managerial positions, are assessed against six distinct factors each of which is critical to the success

of R&D laboratories. Technical opportunities outside of the laboratory are contingent upon the need of the organization to conduct relevant, significant, and reputable R&D.

During the earlier stages of technical career progression, each civil servant S&E should plan on attaining a technical doctoral degree. Those who did not attain the M.S. prior to this time should pursue the master's degree first. Advanced academic degrees bring professional recognition to both the employee and the Air Force. Business or other non-technical degrees are not significantly relevant to the Air Force achieving its technical mission.

Level II and III certification in APDP should be considered only as a function of the technical advice the incumbents in these positions are expected to provide in the acquisition process. Certification is not a function of grade for technical positions. This same rationale should be used in identifying which professional military education and Management Development Seminar/Assessment courses these individuals should take.

Due to the necessity for civilians in pursuit of technical opportunities to remain competitive for entry-level management positions, employees should consider applying for Intermediate Service School, Level II-APDP, one or two year career broadening assignments, and first level Management Development Seminars. At the same time, these employees should seek opportunities to further develop their technical expertise (depth) by participating in technical association seminars, conferences, and symposia.

Advancement through the General Service grades remains based in the level of technical recognition, report, and degree of professional contacts. Current US Office of Personnel Management Position Classification Standards have been constructed to account for such promotion structure. Promotion within this progression track is aimed at

the Scientific and Professional (ST) rather than Senior Executive Service (SES) positions. A dual-track S&E career progression path enables the Air Force to employ the "best" technical professionals as well as motivated, technically experienced administrators.

Notes

[1] Air Force Manual (AFMAN) 36-606, *Air Force Civilian Career Program Management*, 1999. (DRAFT)

[2] "Civilian Leadership Framework (Notional)" Air Force Directorate of Personnel, n.p.; on-line, Internet 1 February 1999, available from http://www.dp.hq.af.mil/DP/dpde/path.ppt.

[3] *Strategic Plan: Air Force Scientist and Engineer Career Program*, (Randolph AFB, Texas: Air Force Personnel Center, 1999).

[4] Colonel T. Jan Cerveny, Air Force Office of Scientific Research, Washington, D.C., interviewed by author, 8 February 1999.

[5] *Guide to Senior Executive Service Qualifications*, (Washington, D.C.: U.S. Office of Personnel Management, 1998).

[6] "Air Force Laboratory Personnel Demonstration Project", *Federal Register* 61, no. 230, part V (November 1996).

Chapter 7

Conclusions

> *As we move into the 21st Century, it will take leadership and cooperation across all functional areas to mold our Air Force to meet the national security demands of the future.*
>
> Maj Gen Susan L. Pamerleau and Ms. Darleen A. Druyun
> *Strategic Plan: Air Force Scientist and Engineer Career Program*

This nation survives off the Air Force's ability to provide the world's preeminent aerospace force trained, organized, and equipped "to shape the international environment; respond to the full spectrum of crises; and prepare today for an uncertain future."[1] Given the future reality of full spectrum conflicts, the ability to attain air and space superiority, information superiority, precision engagement, and, to a lesser degree, rapid global mobility and agile combat support can be achieved only via warfighters with absolute and dominant technical superiority.

Such technical predominance is achieved *only* through the employment of "the best" and "the brightest" technically oriented science and engineering force, technical and managerial. These employees are indispensable both for conducting relevant and mission-essential in-house research and development as well as managing these and contracted technical activities. "The foundation of a strong technical and managerial leadership in the Air Force is based on blended technical and managerial career growth within the scientist and engineer community."[2] To accomplish this, the Air Force is

"fostering a complementary civilian and military workforce to maintain technical superiority… [by] providing a framework for scientist and engineer professional and leadership development."[3]

This framework is described to employees, military and civilian, in the form of approved and recognized career path pyramids and assignment protocols. Both the civilian and military career programs are currently reassessing these processes. Although substantial revision is being proposed, the changes are insufficient and, to some degree, cosmetic.

This project outlines an alternative, and coordinated, modification to both civilian and military career progression and assignment frameworks. It highlights the necessity for establishing comprehensive dual-track career progression opportunities within each community. Through reengineered and proactive career management, the Air Force can place "the right" person, military or civilian, in "the right" job at "the right" time in the person's career, doing what's "best" for the individual and for the Air Force. "The Air Force scientist and engineer community, military and civilian, is one team with one mission."[4]

Notes

[1] Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, September 1997.

[2] *Strategic Plan: Air Force Scientist and Engineer Career Program*, (Randolph AFB, Texas: Air Force Personnel Center, 1999).

[3] Ibid.

[4] Ibid.

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